REMARKS

This is intended as a full and complete response to the Final Office Action dated April 5, 2006, having a shortened statutory period for response set to expire on July 5, 2006. Please reconsider the claims pending in the application for reasons discussed below.

Claims 1-22 remain pending in the application and are shown above. Claims 1-22 are rejected. Applicants propose canceling claims 2 and 10 without prejudice. Reconsideration of the rejected claims is requested for reasons presented below.

Applicants propose amending claims 1 and 9 to include the subject matter of claims 2 and 10 respectively. Applicants submit that the proposed amendments do not add new matter.

Claim Rejections Under 35 U.S.C. §103(a)

Claims 1, 3-9, and 11-18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dakshina-Murthy et al.* (US 6,884,733) in view of *Yang, et al.* (US 2003/0003771). Claims 2, 10, and 19-22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dakshina-Murthy et al.* in view of *Yang et al.* and further in view of *Park et al.* (US 2004/0224241). Applicants propose canceling claims 2 and 10. Applicants propose amending claims 1 and 9 to include the subject matter of claims 2 and 10 respectively. Applicants believe that claims 1, 3-9, 11-22 are in condition for allowance for the reasons presented below.

The Examiner states that *Dakshina-Murthy et al.* fails to disclose an aluminum or aluminum alloy for the conductive gate material. The Examiner states that *Park et al.* discloses aluminum alloys are conventionally used as gate conductors. The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of *Dakshina-Murthy et al.* to use the aluminum alloy gate conductor of *Park et al.* because *Park et al.* discloses aluminum alloys are conventionally used as gate conductors. The Examiner further concludes that one of ordinary skill in the art would have been motivated to use an aluminum alloy as the gate conductor instead of polysilicon in order to reduce signal delay due to the

low resistivity of the material. The Examiner states that the amorphous carbon layer will still be used as a mask.

The Examiner bears the initial burden of establishing a *prima facie* case of obviousness. *See* MPEP § 2142. To establish a *prima facie* case of obviousness three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *See* MPEP § 2143. The present rejection fails to establish at least the first element.

Dakshina-Murthy et al. discloses depositing an amorphous carbon mask on a doped polysilicon material, and then depositing an anti-reflective cap layer on the amorphous carbon layer. *Dakshina-Murthy et al.* further discloses that conventional processes typically utilize polysilicon based gate conductors because metal gate conductors are difficult to etch, are less compatible with front-end processing, and have relatively low melting points. Col 1-2, lines 65-67; 1-2.

Yang et al. discloses providing a thin layer of an adhesion promoter material, such as relatively hydrogen-free hydrogenated silicon carbon (SiC:H), between layers of silicon nitride (Si_3N_4) and an amorphous fluorocarbon (a-F:C) to enhance the adhesion and mechanical properties of the damascene structure. *See* U.S. Pat App. Pub. No. 2003/0003771 at [0001].

Park et al. discloses gate lines as well as a gate shorting bar including two films having different physical characteristics, a lower film and an upper film. *See* U.S. Pat. App. Pub. No. 2004/0224241 at [0069]. The upper film is preferably made of a low resistivity metal including Al containing metal such as Al and Al alloy for reducing signal delay or voltage drop in the gate lines. *See* U.S. Pat. App. Pub. No. 2004/0224241 at [0069]. On the other hand, the lower film is preferably made of material such as Cr, Mo, Mo alloy, Ta and Ti, which has good physical, chemical, and electrical contact characteristics with other oxide materials such as indium tin oxide (ITO) and indium zinc oxide (IZO). *See* U.S. Pat. App. Pub. No. 2004/0224241 at [0069].

The combined references fail to teach, motivate or suggest a method for processing a substrate in a processing chamber, comprising forming an aluminum-containing layer on a surface of the substrate, depositing an amorphous carbon layer on the aluminum-containing layer by a method comprising introducing into the processing chamber one or more hydrocarbon compounds having the general formula C_xH_y, wherein x has a range of 2 to 4 and y has a range of 2 to 10, and generating a plasma of the one or more hydrocarbon compounds by applying power from a dual-frequency RF source, etching the amorphous carbon layer to form a patterned amorphous carbon layer, and etching feature definitions in the aluminum-containing layer corresponding to the patterned amorphous carbon layer as recited in claim 1 and claims 3-8 dependant thereon. Therefore claims 1 and 3-8 are believed to be allowable and allowance of the claims is respectfully requested.

The combined references also fail to teach, motivate or suggest a method for processing a substrate in a chamber, comprising forming an aluminum-containing layer on a surface of the substrate depositing an amorphous carbon hardmask on the aluminum-containing layer by a method comprising introducing into the processing chamber one or more hydrocarbon compounds having the general formula C_xH_y, wherein x has a range of 2 to 4 and y has a range of 2 to 10, and generating a plasma of the one or more hydrocarbon compounds by applying power from a dual-frequency RF source, depositing an anti-reflective coating on the amorphous carbon hardmask, depositing a patterned resist material on the anti-reflective coating, etching the anti-reflective coating and amorphous carbon hardmask to the aluminum-containing layer, and etching feature definitions in the aluminum-containing layer as recited in claim 9 and claims 11-18 dependent thereon. Therefore claims 9 and 11-18 are believed to be allowable and allowance of the claims is respectfully requested.

The combined references also fail to teach, motivate or suggest a method for processing a substrate in a chamber, comprising: forming an aluminum-containing layer on a surface of the substrate, depositing an amorphous carbon hardmask on the aluminum-containing layer by a method comprising introducing into the processing chamber one or more hydrocarbon compounds having the general formula C_xH_y, wherein x has a range of 2 to 4 and y has a range of 2 to 10, and generating a plasma

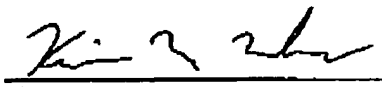
of the one or more hydrocarbon compounds by applying power from a dual-frequency RF source, depositing an anti-reflective coating on the amorphous carbon hardmask, wherein the anti-reflective coating is a material selected from the group of silicon nitride, silicon carbide, carbon-doped silicon oxide, amorphous carbon, and combinations thereof, depositing a patterned resist material on the anti-reflective coating, etching the anti-reflective coating and amorphous carbon hardmask to the aluminum-containing layer, removing the resist material, etching feature definitions in the aluminum-containing layer at an etch selectivity of amorphous carbon to the aluminum-containing between about 1:3 and about 1:10, and removing the one or more amorphous carbon layers by exposing the one or more amorphous carbon layers to a plasma of a hydrogen-containing gas or an oxygen-containing gas as recited in claim 19 and claims 20-22 dependent thereon. Therefore claims 19 and 20-22 are believed to be allowable and allowance of the claims is respectfully requested.

Conclusion

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

Having addressed all issues set out in the Final Office Action, Applicants respectfully submit that the claims are in condition for allowance and respectfully requests that the claims be allowed.

Respectfully submitted,



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